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## THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

### PRELIMINARY ANNOUNCEMENT OF THE NEW YORK MEETING

Edited by Dr. F. R. MOULTON

PERMANENT SECRETARY

THE one hundred eleventh meeting of the association will be held in New York City from next December 28 to January 2, inclusive. This will be the sixth meeting of the association in New York, the first having been held in August, 1887, thirty-nine years after the association was organized; the second in June, 1900; the third in December, 1906-January, 1907; the fourth in December, 1916; and the fifth in December, 1928-January, 1929.

All earlier meetings of the association in New York City were held while the United States was at peace, though in December, 1916, the first World War was in its third year, and it was becoming evident that the United States would be drawn into it. Now this coun-

try is involved in a war that is making unparalleled demands upon all its resources. Under these conditions obviously no scientific meeting or other convention should be held unless it contributes much to the current war effort and begins to look forward to the post-war future. Fortunately a large meeting can be held in New York City with a minimum of railroad travel because about 3,000 members of the association live in the City and about 10,000 within three or four hours' travel.

In order to compare the coming meeting of the association with earlier meetings held in New York City, a few statistics will be presented. The membership for 1942 is as of September 30, the end of the

fiscal year. The number of papers that will be presented is of course as yet subject to some uncertainty and the number of persons who will register is only a conjecture.

Year	Membership	Papers Read	Registration
1887	1,956	250	729
1900	1,925	253	447
1906-07	4,498	360	934
1916	No record	1,252	2,100 ±
1928-29	16,328	2,200 ±	3,935
1942-43	23,671	1,500 ±	3,000 ±

The New York meeting will be not only a large gathering of scientists but one in which many fields of science will be represented. Its value will depend fully as much upon the diversity of the interests represented as upon the number of scientists attending its programs. Fifteen of the association's sections will either present individual programs or participate in joint programs. In addition, 44 affiliated associated and cooperating societies will hold sessions ranging in character from those at which scores of technical papers will be presented to dinners or luncheons at which addresses by distinguished scientists will be delivered.

Naturally the war and questions related to the war will receive a great deal of attention, often in joint programs of two or more sections or societies. For example, there will be symposia on such important subjects as food in war and peace, strategic materials, nutrition, development of humid tropics, war and post-war readjustment of personnel, the outlook for rubber, tropical medicine, science in the war of production and high-school science and the manpower problem. Although thousands of scientists are either in the armed services of the country or otherwise engaged in war work, still many scientists of the highest distinction and representatives of the Government will attend the meeting either because of their official positions or because they will appear on important programs. For example, Dr. Irving Langmuir, retiring president of the association, will deliver his retiring address, and Dr. Arthur H. Compton, now president of the association, will preside at all general sessions, while Dr. Ruiz Castañeda, a distinguished scientist from Mexico City, will deliver the Theobald Smith Lecture of the New York Society of Tropical Medicine at a joint session with the Section on Medical Sciences. The New York meeting promises to be a very good one because of the war as well as in spite of the war.

#### REGISTRATION

There will be two principal places of registration, one in the Hotel Commodore and the other in the Hotel Pennsylvania. In addition, there will be regis-

tration branches in the Henry Hudson Hotel and the Hotel Edison.

Each person registering will receive a General Program of the meeting, a book of about 250 pages which will contain (a) complete information respecting hotel headquarters for all sections and societies, (b) a schedule of all general sessions, (c) complete scientific programs of all sections and societies, (d) a schedule of all special dinners, luncheons and breakfasts, (e) an alphabetical index of all persons appearing on the programs, (f) lists of officers of the association and of societies participating in the meeting, (g) a brief description of each exhibit in the Science Exhibition and (h) a daily summary of events. Each person registering will receive also an identification card that may be required for admittance to certain functions or programs. Free copies of *SCIENCE*, *The Scientific Monthly* and the *A.A.A.S. Bulletin* and lists of the publications of the association will be available at each of the registration places, and tickets to dinners and luncheons will be on sale at the places of registration. The registration fee will be one dollar as heretofore.

#### HOTELS AND HEADQUARTERS

*Mathematics (A)*: Section on Mathematics; American Mathematical Society; Mathematical Association of America; Institute of Mathematical Statistics—Hotel Governor Clinton.

*Physics (B)*: Section on Physics; American Physical Society; American Association of Physics Teachers; Sigma Pi Sigma Physics Honor Society—Hotel Pennsylvania. American Meteorological Society—Hotel Governor Clinton.

*Chemistry (C)*: Section on Chemistry—Hotel Pennsylvania.

*Astronomy (D)*: Section on Astronomy—Hotel Pennsylvania.

*Geology and Geography (E)*: Section on Geology and Geography; Geological Society of America; Association of American Geographers—Hotel Pennsylvania.

*Zoological Sciences (F)*: Section on Zoological Sciences; American Society of Zoologists; American Society of Parasitologists—Hotel Commodore. American Association of Economic Entomologists; Entomological Society of America—Hotel New Yorker.

*Botanical Sciences (G)*: Section on Botanical Sciences; Botanical Society of America; American Society of Plant Physiologists; American Society of Plant Taxonomists; American Fern Society—Hotel Commodore. American Phytopathological Society—Hotel Edison.

*Zoological and Botanical Sciences (F-G)*: American Society of Naturalists; Ecological Society of America; Genetics Society of America; American Microscopical Society; Union of American Biological Societies—Hotel Commodore. National Association of Biology Teachers—Hotel Governor Clinton.



*Anthropology (H)*: Section on Anthropology—Hotel Pennsylvania.

*Psychology (I)*: Section on Psychology—Hotel Pennsylvania.

*Social and Economic Sciences (K)*: Section on Social and Economic Sciences; Econometric Society—Hotel Pennsylvania. Biometrics Section, American Statistical Association; Metric Association—Hotel Commodore.

*Historical and Philological Sciences (L)*: Section on Historical and Philological Sciences—Hotel Pennsylvania.

*Engineering (M)*: Section on Engineering—Hotel Commodore.

*Medical Sciences (N)*: Section on Medical Sciences; Subsection on Dentistry—Hotel Commodore. Subsection on Pharmacy; U. S. Public Health Service—Hotel Pennsylvania.

*Agriculture (O)*: Section on Agriculture; American Society for Horticultural Science—Henry Hudson Hotel. Potato Association of America—Hotel Edison.

*Education (Q)*: Section on Education—Hotel Pennsylvania.

*Science in General*: Society of the Sigma Xi; American Science Teachers Association; American Nature Study Society; Gamma Alpha Graduate Scientific Fraternity; Cooperative Committee on Science Teaching; United Chapters of Phi Beta Kappa—Hotel Pennsylvania. Sigma Delta Epsilon, Graduate Women's Fraternity; American Association of Scientific Workers—Hotel Commodore. New York State Science Teachers Association—Hotel Governor Clinton. Research Council on Problems of Alcohol—Hotel Roosevelt.

#### HOTEL RATES

In the list that follows the rates are for single and double rooms with bath, respectively.

*Commodore*, Lexington Ave and 42nd St.: \$3.50, \$5.50-\$6.60.

*Roosevelt*, Madison Ave. and 45th St.: \$3.50, \$5.50-\$6.60.

*Pennsylvania*, 7th Ave. and 33rd St.: \$3.50-\$7.70; \$5.50-\$9.90.

*New Yorker*, 34th St. and 8th Ave.: \$3.50-\$4.40; \$5.50-\$7.70.

*Governor Clinton*, 31st St. and 7th Ave.: \$3.00-\$3.85; \$4.50-\$7.70.

*Henry Hudson*, 353 W. 57th St.: \$2.50-\$3.00; \$3.50-\$4.00.

*Edison*, 46th St., west of Broadway: \$3.00-\$4.00; \$4.50-\$5.50.

#### BUSINESS SESSIONS

*The Executive Committee of the Council* will meet in the permanent secretary's room in the Hotel Pennsylvania on Sunday afternoon, December 27, at 4 o'clock, and thereafter as may be arranged.

*The Council* of the association will meet on Monday afternoon, December 28, at 2:15 in Parlor 1 in the Hotel Pennsylvania. Later sessions of the council will be held in the same room on mornings at 9 o'clock as agreed upon at the first session. It is expected that the session of the council at which the president for

1943 will be elected will be held at 9 A.M. on Thursday, December 31.

Subjects to be considered by the council are usually first brought before the executive committee through the permanent secretary. Communications for the executive committee may be submitted in writing, at the mail clerk's desk in Hotel Pennsylvania, addressed to Dr. F. R. Moulton. Matters should be communicated early in the meeting in order that their consideration may not have to be deferred to a later meeting.

*The Academy Conference* will be held on Monday, December 28, at 3:30 P.M., or immediately following the first session of the council, in Parlor 1 in the Hotel Pennsylvania. The session will be followed by a dinner at 6:30 P.M., in Parlor 2, Hotel Pennsylvania.

*The Secretaries Conference* will be held on Thursday, December 31, beginning with a dinner at 6:30 P.M., in Parlor A, Hotel Pennsylvania.

#### ANNUAL SCIENCE EXHIBITION

The annual science exhibition will be held in the Grand Ballroom of the Hotel Commodore. It will be open to the public from 10 A.M. until 9 P.M. on Monday-Wednesday, December 28-30, and from 9 A.M. until 1 P.M. on Thursday, December 31.

#### GENERAL SESSIONS

On Monday, December 28, at 8:30 P.M., Dr. Irving Langmuir, associate director of the Research Laboratory of the General Electric Company, will deliver his address as retiring president of the American Association for the Advancement of Science in the Grand Ballroom of the Hotel Pennsylvania.

On Tuesday, December 28, at 8:30 P.M., Dr. John T. Tate, dean of the College of Science, Literature and the Arts, University of Minnesota, will deliver the twenty-first annual lecture under the joint auspices of the American Association for the Advancement of Science and the Society of the Sigma Xi, in the Grand Ballroom of the Hotel Pennsylvania. The subject of Dr. Tate's lecture is "Scientists in War and Peace."

On Wednesday, December 29, at 8:30 P.M., the Honorable Dr. Hu Shih, formerly Ambassador from the Chinese Government to the Government of the United States, will deliver the eighth annual lecture under the joint auspices of the American Association for the Advancement of Science and the United Chapters of Phi Beta Kappa, in the Grand Ballroom of the Hotel Pennsylvania.

#### DINNERS AND LUNCHEONS

##### Monday

Reception following retiring president's address. Hotel Pennsylvania.

National Association of Biology Teachers. Luncheon.  
Hotel Governor Clinton.

#### Tuesday

Sigma Pi Sigma Physics Honor Society. Luncheon.  
American Society of Parasitologists. Luncheon. Hunter  
College.  
American Physical Society. Dinner.  
Section on Chemistry. Dinner. Hotel Pennsylvania.  
American Phytopathological Society. Dinner. Hotel  
Edison.  
American Society of Plant Physiologists. Dinner. Hotel  
Commodore.  
Ecologists' Dinner. Hotel Commodore.  
Biologists' Smoker. Hotel Commodore.

#### Wednesday

American Science Teachers Association. Luncheon.  
Hotel Pennsylvania.  
Section on Engineering. Luncheon. Hotel Commodore.  
Section on Geology and Geography. Dinner.  
Zoologists' Dinner. Hotel Commodore.  
Entomologists' Dinner. Hotel New Yorker.  
Botanists' Dinner. Hotel Commodore.  
Metric Association. Dinner. Hotel Commodore.  
American Society for Horticultural Science. Dinner.

#### Thursday

Naturalists' Dinner. Hotel Commodore.

### SECTION AND SOCIETY PROGRAMS

In addition to the 15 sections of the association, about 44 affiliated and associated societies and other cooperating organizations will participate in the New York meeting. Many of the programs are subject to possible changes and the details of several programs are not yet available.

*The Section on Mathematics and affiliated societies* (Dec. 28-30). Section A will hold a joint session with the American Mathematical Society, the Mathematical Association of America and the Institute of Mathematical Statistics on Wednesday morning, at which G. T. Whyburn, vice-president of the association for the section, will deliver his retiring address on "Reduction of Mappings."

*The American Mathematical Society* will hold sessions from Monday to Wednesday, inclusive. On Monday the sessions will be for the presentation of general papers; on Tuesday morning Deane Montgomery will deliver an address on "Transformation Groups and Spheres"; on Tuesday afternoon the annual J. Willard Gibbs Lecture will be delivered by John von Neumann on "The Ergodic Theorem and Statistical Mechanics"; on Wednesday morning the society will join with Section A for the address of G. T. Whyburn on "Reduction of Mappings," and on Wednesday afternoon the society will hold a joint session with sections B,

D and L for the presentation of a symposium on "Freedom of Thought and Science."

*The Mathematical Association of America* will hold a session on Wednesday morning for the discussion of the adjustments that departments of mathematics are making to meet the demands arising from the war. On Wednesday afternoon the society will join with sections A, B, D and L in the symposium on "Freedom of Thought and Science," and with the Cooperative Committee on Science Teaching in its programs on "High School Science and the War."

*The Institute of Mathematical Statistics* will join with the American Mathematical Society in its various programs.

*The Section on Physics and affiliated societies* (Dec. 28-30). On Tuesday the section will hold a joint session with the American Physical Society and the Society for X-ray and Electron Diffraction. On Wednesday the section will join with the American Physical Society, the American Association of Physics Teachers and sections A, D and L in two symposia, in the morning on "Freedom of Thought and Science" and in the afternoon on "The Philosophy of Physical Science."

*The American Physical Society* will hold sessions on Monday and Tuesday, in addition to participating in the symposia on Wednesday. On Tuesday evening the society and the American Association of Physics Teachers will hold a joint dinner.

*The American Association of Physics Teachers* will join with Section Q in sponsoring addresses by past presidents of the association, and will hold a session for the delivery of the annual Richtmyer Lecture and the presentation of the Oersted Medal.

*The Sigma Pi Sigma Physics Honor Society* will hold a luncheon on Tuesday.

*The Section on Chemistry* (Dec. 29-30) will hold three symposia, two on Tuesday and the third on Wednesday morning, and a dinner on Tuesday evening in honor of Henry C. Sherman, of Columbia University, following which a program of three papers on nutrition will be presented. All programs except that of the third symposium will be presented under the chairmanship of Hugh S. Taylor, vice-president of the association for the section.

The Tuesday morning symposium will be on "The Food Industry in War and Peace." Introductory remarks by the chairman will be followed by papers: "Sugars in Wartime," Arthur P. Hellwig; "Newer Knowledge of the Chemistry of Bread," John C. Baker; "Can Maker's Wartime Problems," James A. Stewart; "Dehydrated Foods," R. S. Hollingshead; and "Quick Frozen Foods," E. T. Gibson. The afternoon symposium on "Strategic Materials" consists of three papers: "Synthetic Rubber," Per K. Frolich; "Quinine and Antimalarials," Marston T. Bogert; and



"Non-Ferrous Materials," Colin G. Fink. The program following the Tuesday evening dinner is: "Origin and Function of Vitamin C," C. G. King; "Food Nutrition in Relation to World Adjustment," Frank G. Boudreau; and "Calcium, Riboflavin and Vitamin A in Nutrition," Henry C. Sherman.

The Wednesday morning symposium on "Utilization of Farm Commodities in Industry," under the chairmanship of O. E. May, is as follows: "Introductory Remarks. Life and Work of Henry G. Knight," O. E. May; "Fermentation as a Tool in the Industrial Utilization of Farm Products," Robert D. Coghill; "Starch Adhesives," Lee T. Smith; "Laws of Nature," Wheeler McMillen; "Starch Industry," W. B. Newkirk; and "Alcohol Present and Future," Paul Kolachov.

*The Section on Geology and Geography, the Geological Society of America and the Association of American Geographers (Dec. 30-31)* will hold two joint sessions on Wednesday, a joint dinner on Wednesday evening, to be followed by an address by Morris M. Leighton, vice-president of the association for the section on "Present Knowledge and Problems Concerning the Glacial History of Illinois," a session on Thursday morning for general geographic papers, and a final session in the afternoon for general geologic papers.

The Wednesday morning program is a symposium on "Development of the Humid Tropics with Special Reference to Latin America," and the afternoon symposium is on "War and Post-War Readjustment of Personnel."

*The Section on Zoological Sciences and affiliated and associated societies (Dec. 28-31).* The section will join with the American Society of Zoologists in its programs (reported to be unexpectedly large, including two symposia, one to be held on Wednesday afternoon jointly with the Genetics Society of America on "Immunological Techniques in Biological Research" and the other to be held on Thursday afternoon jointly with the American Society of Naturalists on "The Naturalist in America").

*The American Association of Economic Entomologists (Dec. 29-31)* will present a program largely devoted to problems related to the war. After a meeting of the Section of Agriculture on Tuesday morning, H. B. Weiss, president of the society, will deliver his presidential address on "Color Perception in Insects." The Tuesday afternoon program will be a joint symposium with the Entomological Society of America on "Entomology and the War." In the evening F. M. Carpenter will deliver a public address on "The Earliest Insects" before a joint meeting of the society and the Entomological Society of America.

On Wednesday morning the Section of Extension will hold a conference on the work of entomologists

in support of the U. S. Department of Agriculture's goals for the production of war supplies. At the same time the society will join the Biometrics Section of the American Statistical Association, the American Phytopathological Society and the Entomological Society of America in a conference on "Reduced Dosages of Insecticides and Fungicides," under the chairmanship of C. I. Bliss. In the afternoon the Teaching Section will hold a session, and a session will be held for the presentation of general papers. On Wednesday evening the two entomological societies will hold the annual entomologists' dinner.

On Thursday morning the society will hold a general session, and its Section of Plant Quarantine and Pest Control will present a program of papers in its own field. In the afternoon the society will hold a business meeting, followed by a session for the presentation of general papers.

The Committee on Coordination of Entomology with the War Effort appointed by the society for each of thirty-five important agricultural products will report informally on its work during 1942.

*The Entomological Society of America (Dec. 29-31)* will hold eight sessions, three of which will be joint sessions with the American Association of Economic Entomologists, and the society will be a joint sponsor of the annual entomologists' dinner. The sessions for the presentation of general papers will be held on Tuesday morning, Wednesday morning and afternoon and Thursday morning and afternoon.

*The American Society of Parasitologists (Dec. 28-30)* has scheduled its program in six sessions at which 42 papers will be read by the authors, two presented only as demonstrations and 23 read by title. In addition, the society is a joint sponsor with the Section on Medical Sciences (N), the National Malaria Society, the American Society of Tropical Medicine and the New York Society of Tropical Medicine for two sessions on "Tropical Medicine."

On Monday afternoon the society will hold a session at which 11 technical papers will be presented. A session will be held on Tuesday morning at which 7 papers will be presented, following which Henry E. Meleney, president of the society, will deliver his presidential address on "The Role of Parasitologists in World War II." After the annual Parasitologists' Luncheon, the society will hold its annual business meeting. The afternoon program will consist of demonstrations and, by invitation, Eugene R. Kellersberger will deliver, by invitation, an illustrated address on "African Sleeping Sickness."

On Wednesday the society will hold both morning and afternoon sessions at each of which 11 papers will be presented.

*The Section on Botanical Sciences and Affiliated Societies (Dec. 29-31).* The section will hold a joint



session with the Botanical Society of America, the American Phytopathological Society, the American Society of Plant Physiologists, the American Society of Plant Taxonomists and the American Fern Society at which G. M. Smith, retiring vice-president for the section, will deliver his address on "The Marine Algae of the Monterey Peninsula." The address will be followed by a symposium of three papers on "Botany and the War."

*The Botanical Society of America* (Dec. 29-31) will hold sessions for the presentation of papers under the General, Paleobotanical, Physiological and Systematic sections of the society. A special program has been organized for Tuesday afternoon by the Cooperative Committee on Science Teaching on "High School Science and the War." A joint symposium of the Physiological Section of the society, the American Society of Plant Physiologists and the American Society for Horticultural Science on "Some Aspects of Mineral Nutrition in Plants and in Animals" will be presented on Wednesday afternoon. On Wednesday evening John T. Buchholz, president of the society, will deliver his retiring address at the annual dinner for all botanists.

*The American Phytopathological Society* (Dec. 28-31) will hold four joint sessions and four sessions independently.

The program for Monday afternoon consists of a conference, sponsored by the Committee on Coordination in Cereal and Vegetable Seed Treatment Research, on seed treatment with reports on 1942 results, under the chairmanship of M. B. Moore; and a discussion on the integration of seed treatment services with the war effort in 1943, under the leadership of G. L. McNew. On Monday evening the society will hold a discussion on the importance and advisability of an adequate plant disease survey to protect vital economic crops, under the direction of the Plant Disease Survey Sub-Committee of the War Emergency Committee, J. G. Leach, chairman.

On Tuesday morning there will be brief reports from the executive committee, subcommittees and regional committees of the society's War Emergency Committee, followed by a discussion to assist the War Emergency Committee in determining future policies. The afternoon session will be devoted to a discussion of the question, "What Should be our Major Plant Disease Control Objectives in 1943?"

On Tuesday afternoon the society will join in the symposium of Section G on "Botany and the War."

On Wednesday morning the society will hold a joint session with the Biometrics Section of the American Statistical Association and the American Association of Economic Entomologists on "Reduced Dosages of Insecticides and Fungicides." On Wednesday afternoon the society will hold a joint session with the

Potato Association of America on potato diseases and their control.

On Thursday morning the society will hold a joint session with the American Association of Economic Entomologists for a program on "Pest Control—A New Science and its Supporting Sciences."

*The American Society of Plant Physiologists* (Dec. 29-31) will hold joint sessions with the Physiological Section of the Botanical Society of America on all three days of its meeting, and will join other societies in the field of botany in the program on Tuesday afternoon at which the address of G. M. Smith, the retiring vice-president for Section G, will be delivered. On Wednesday it will hold a joint session with the Physiological Section of the Botanical Society of America and the American Society for Horticultural Science in a symposium on "Some Aspects of Mineral Nutrition in Plants and in Animals." The annual Physiologists' dinner will be held on Tuesday evening.

*The American Society of Naturalists* (Dec. 30-31) will sponsor the Biologists' Smoker on Tuesday evening. In a joint session with the zoological and botanical societies, the society will hold a symposium on "The Naturalist in America" on Thursday afternoon. The Naturalists' dinner will be held on Thursday evening.

*The Ecological Society of America* (Dec. 29-31) will hold four joint sessions with other societies, seven sessions for the presentation of technical papers, two sessions for the transaction of business and a dinner. On Tuesday morning the society will hold two sessions, one on animal ecology and one on plant ecology. On Wednesday and Thursday mornings the society also will hold two sessions on the same subjects, and a session on Wednesday afternoon for discussion of ecological work in relation to war conditions. On Thursday afternoon the society will hold a joint symposium with the Biometrics Section of the American Statistical Association on "The Problem of Optimal Catch," under the chairmanship of A. G. Huntsman, of the Fisheries Research Board of Canada.

*The Genetics Society of America* (Dec. 29-31) will present one "Invitation Program," join in three symposia with other societies, hold two sessions for the presentation of general papers and an evening session for an informal discussion of the contributions that genetics and geneticists may make in the present emergency. The contributors to the invitation program include Martha Lee Bozeman, H. J. Muller, Elizabeth S. Russell and W. Lawson Russell, Harold H. Smith, T. M. Sonneborn, L. J. Stadler and Herschel Roman, Curt Stern, and F. S. Straus and J. W. Gowen. On Wednesday afternoon the society will join with the American Society of Zoologists in



a symposium on "Immunological Techniques in Biological Research," with the Biometrics Section of the American Statistical Association in a symposium on the "Distribution of Gene Frequencies," and with the American Society of Naturalists in a symposium on "The Naturalist in America."

*The American Microscopical Society* (Dec. 28) will hold two business sessions on Monday, the executive committee luncheon and the annual business meeting in the afternoon.

*The National Association of Biology Teachers* (Dec. 28) will hold a luncheon on Monday and a session for the presentation of papers on which Oscar Riddle, Jay B. Nash, E. Laurence Palmer and O. E. Fink will appear. In addition, there will be motion picture demonstrations by New York City high schools.

*The Section on Anthropology*, in cooperation with the American Association of Physical Anthropologists and with geneticists representing the Eugenics Conference, will hold sessions at which attention will be centered on two principal themes, the integration of anthropology with other biological and social sciences, and the possible contributions of anthropology to the present war and the future peace. At least twenty papers will be on the program, most of which are by authors from the New York area.

*The Section on Psychology* (Dec. 29-30) will join the Section on Education in a session at which past presidents of the association will deliver addresses on "What Should the Ordinary Citizen Know About My Field?" and the two sections will hold a joint dinner on Wednesday evening.

*The Section on Social and Economic Sciences* (Dec. 30-31) will hold two sessions of three papers each on "The Placement of Scientific Personnel in the War Effort." At the first session L. K. Frank, vice-president of the association for the section, will deliver his retiring address on "National Resources of Scientific Personnel." It is expected that the British practice in the placement of scientific personnel will be discussed by a speaker not yet announced. Leonard Carmichael will explain the scope and use of the National Roster of Scientific and Specialized Personnel, and James O. Babcock will discuss the work of the Civil Service Commission. Lieutenant Colonel Edward A. Fitzpatrick will discuss the deferment practice with respect to scientific personnel under selective service.

*The Econometric Society* (Dec. 29-30) will hold four sessions on the respective general subjects "Economic Theory and Econometrics," "Economic Statistics," "Applied Economics" and "Economic Life and Depreciation."

*The Section on Historical and Philological Sciences* (Dec. 30-31) has organized with the cooperation of the sections on mathematics, physics and astronomy

two symposia on subjects of great importance in the history of science. The title of the first, which will be held on Wednesday morning, is "Freedom of Thought and Science," a symposium in commemoration of the three hundredth anniversary of Galileo's death. The participants in this symposium will be Henry Crew, on "Galileo, Pioneer in Physics"; George di Santillana, on "Galileo, the Ancient"; and Chauncey D. Leake, on "Contributions of Science to the Concept of Freedom."

The title of the second symposium, which in a sense is a companion to the first, is "Natural Philosophy," a program in commemoration of the three hundredth anniversary of Newton's birth. It will be presented on Wednesday afternoon. The participants in it are Louis T. More, on "Newton's Dualistic Philosophy of Nature"; George D. Birkhoff, on "Newtonian and Other Forms of Gravitational Theory"; and Richard C. Tolman, on "Physical Science and Philosophy." Dr. Tolman's contribution is his retiring address as vice-president of the association for the Section on Physics.

In addition, the section and the History of Science Society will hold a joint session on Thursday morning for the presentation of the program: "Ethico-genesis," retiring address of Chauncey D. Leake, vice-president for the section in 1940; "Influence of Medicine on the Development of Physical Science," by Morris R. Cohen; and "Post-War Reconstruction," by Joseph Mayer, vice-president for the section.

*The Section on Engineering* (Dec. 30) will hold a luncheon and two sessions for the presentation of papers. The general subject of the Wednesday morning session is "Aviation Medicine." The papers to be presented at this session are: "The Tilting Ballistocardiograph: Apparatus for Recording the Thrust of the Heart," by Robert W. Wilkins, M.D., the Robert Dawson Evans Memorial, Boston; "Development of Instruments for Test and Classification of Flight Personnel," by E. Lodwig and J. Zaleski, Mobile Refrigeration, Inc., New York; and "The Application of Engineering Principles to Clinical and Aviation Medicine," by Alvan L. Barsch, M.D., Columbia University.

The general subject of the Wednesday afternoon session is "Dehydration of Foodstuffs." The papers to be presented at this session are: "Theory of Processes," by H. J. Masson, New York University; "Application of Theory to Manufacture," by Graham L. Montgomery, associate editor, *Food Industries*, New York; and "Military and Civilian Practice," by Captain Robert P. Melson, U. S. Quartermaster Corps, Chicago.

At luncheon on Wednesday, Willis R. Woolrich, vice-president of the association for the section and dean of engineering, the University of Texas, will deliver his retiring address on "The Romance and Engineering of Food Preservation."



*Section on Medical Sciences (Dec. 28-30).* The Monday morning session will be devoted to the presentation of a series of papers on various subjects, the contributors being Alexander Hollaender and Jesse P. Greenstein, National Institute of Health; Robert J. Fitzgerald and W. Harry Feinstone, American Cyanamid Company; W. Harry Feinstone, Richard H. Follis, Jr., Roger D. Williams and John F. Kennedy, American Cyanamid Company; W. F. Wells and M. W. Wells, University of Pennsylvania; Milton Levine and David State, Cook County Hospital, Chicago; Trigant Burrow and Hans Syz, the Lifwynn Foundation, New York; and Albert Claude, The Rockefeller Institute for Medical Research, New York.

The program for the Monday afternoon session is a symposium on "Carbohydrate Metabolism," which will be presented under the joint sponsorship of the section and the New York Section of the Society for Experimental Biology and Medicine. The program consists of six papers by D. E. Green (chairman), College of Physicians and Surgeons, Columbia University; S. Ochoa, New York University College of Medicine; W. C. Stadie, the School of Medicine, the University of Pennsylvania; W. W. Westerfield, Harvard University Medical School; K. A. C. Elliott, the Institute of the Pennsylvania Hospital, Philadelphia; R. F. Furehgott and E. Shorr, Cornell University Medical College, New York; and E. A. Evans, Jr., Birgit Vennesland and Louis Slotin, The University of Chicago.

*The Section on Medicine, the American Society of Parasitologists, the National Malaria Society, the American Society of Tropical Medicine and the New York Society of Tropical Medicine* are joint sponsors of two sessions on "Tropical Medicine." At the first (on Tuesday morning) session papers will be presented by Colonel J. S. Simmons, Office of the Surgeon General, the War Department; Colonel Richard P. Strong, Army Medical School, Washington; Lieutenant Colonel Thomas T. Mackie, Army Medical School, Washington; and Alan Gregg, M.D., the Rockefeller Foundation, New York. At the close of this program Arthur H. Compton, president of the association, will present the fifth Theobald Smith Award.

At the Tuesday afternoon session on "Tropical Medicine" papers will be presented by Colonel George R. Callander, Army Medical Center, Washington; Malcolm H. Soule, University of Michigan, Ann Arbor; Lowell T. Coggeshall, Institute of Public Health, University of Michigan, Ann Arbor; and Wilbur A. Sawyer, Rockefeller Foundation, International Health Division, New York. After the completion of this program, Dr. Wade W. Oliver, vice-president of the association for the Section on Medical Sciences, the Long Island College of Medicine, will

deliver his retiring address on "The Man Who Lived for Tomorrow."

On Tuesday evening the section will join with the New York Society of Tropical Medicine at its Theobald Smith Lecture, which will be delivered by M. Ruiz Castañeda, M.D., Hospital General, Departamento de Investigaciones Médicas, Mexico, D. F.

The final session of the Section on Medical Sciences will be held on Wednesday morning for the presentation of papers on a variety of subjects. Those contributing papers include C. C. Macklin, University of Western Ontario, London, Ontario; W. S. Hartroft, University of Western Ontario; Miles Atkinson, New York Hospital; Jesse P. Greenstein, National Cancer Institute, Bethesda, Md.; Ben Karpman, St. Elizabeth's Hospital, Washington; Harry Eagle, The Johns Hopkins Hospital, Baltimore; and E. C. Rosenow, The Mayo Foundation, Rochester, Minn.

*U. S. Public Health Service (Dec. 28-30)* sponsors a symposium on "Drug Intoxication and Drug Addiction," which will be presented at six sessions to be held on Monday, Tuesday and Wednesday.

The Monday morning session will consist of five papers on various subjects under the general head "Barbiturates, Bromides and Chloral." The contributors include Theodore Koppányi, R. P. Herwick, Frank Curran, Max Levin and Lawrence D. Thompson. The Monday afternoon program is on the general subject, "Cocaine, Marihuana and Peyote," to which contributions will be made by A. T. DuMez, George B. Wallace, Dudley D. Shoenfeld, Karl M. Bowman and Samuel Allentuck, and John Collier.

The remaining four sessions will all be devoted to "The Opiates." The contributors to the Tuesday morning session will be: Bertil Renborg, Lyndon F. Small, George W. Merck, Nathan B. Eddy, Fred W. Oberst and Erwin G. Gross, and Howard L. Andrews. This program relates primarily to the opium problem and opium drugs. The contributors to the afternoon program, which relates to drug addiction and physiological effects, are S. D. S. Spragg, Maurice H. Seevers, E. G. Williams, R. R. Brown, H. L. Andrews, Robert C. Batterman and C. K. Himmelsbach, F. W. Oberst and Wendell A. Preston.

On Wednesday the papers in the morning program concern primarily the drug addict. Contributors to this session will be R. R. Brown, D. C. Cameron, M. A. Diamond, Robert P. Knight, Robert H. Felix, Michael J. Pescor and J. D. Reichard. The final session on Wednesday afternoon will be concerned with the legal and administrative aspects of the prevention and control of drug addiction. The first four contributors to this session will be H. L. Anslinger, Herbert O. Calvery, Morris Ploscowe and Walter K. Urich.

The symposium will close with a public meeting at 4 o'clock on Wednesday afternoon at which Dr.



Thomas Parran, Surgeon General, U. S. Public Health Service, will introduce Dr. Lawrence Kolb, Assistant Surgeon General, Division of Mental Hygiene, U. S. Public Health Service, who will deliver an address on "Drug Addiction as a Public Health Problem."

*The Section on Agriculture (Dec. 30)* and the American Society for Horticultural Science will present a joint symposium of five papers on "Nutrition" as follows: "Nutritional Requirements of Animals. Some Deficiencies Coming through Soils and Crops," L. A. Maynard, Cornell University; "Nutritional Requirements of Man. Vitamins—the More Recent Developments," C. A. Elvehjem, the University of Wisconsin; "Field Crop Production for Efficient Feeding (retiring vice-president's address), Richard Bradfield, Cornell University; "Fruit and Vegetable Production for Efficient Food," J. R. Magness, U. S. Bureau of Plant Industry, Beltsville, Md.; and "Utilization of Foods in the Human Diet," Lydia Roberts, The University of Chicago.

*The American Society for Horticultural Science (Dec. 29–30)* will hold sectional sessions for the presentation of papers on Tuesday morning and afternoon, and in the afternoon the Section on Vegetable Crops will hold a joint session with the Potato Association of America. On Tuesday evening the society will hold round table discussions on "varieties, nomenclature, fertilizers and extension methods" and a joint session with the Biometrics Section of the American Statistical Association.

On Wednesday morning the society will hold a joint session with the Section on Agriculture for the presentation of a symposium on "Nutrition"; and in the afternoon a joint symposium with the Physiological Section of the Botanical Society of America and the American Society of Plant Physiologists on "Some Aspects of Mineral Nutrition in Plants and in Animals." On Wednesday evening it will hold its annual banquet and social evening, at which Dr. J. C. Miller, president of the society, will deliver his retiring address.

*The Section on Education (Dec. 29–30)* will meet jointly on Tuesday and Wednesday with the Section on Psychology for a series of addresses by past presidents of the association on "What Should the Ordinary Citizen Know About My Field?" Societies which will join in at least a part of this program include the American Association of Physics Teachers, the American Science Teachers Association and the Cooperative Committee on Science Teaching.

On Wednesday evening the section and the Section on Psychology will hold their annual joint dinner at which Dr. Harold Clark, vice-president for the Section on Education, will deliver his retiring address on "Scientific Experiments in Social Sciences." The recent untimely death of Dr. Edmund S. Conklin, vice-

president of the association for the Section on Psychology, will deprive the dinner of a second vice-presidential address.

*The Society of the Sigma Xi (Dec. 28–29)* will hold meetings of its executive committee on Monday evening and Tuesday morning, and its forty-third annual convention on Tuesday at 3:00 P.M. On Tuesday evening the twenty-first annual Sigma Xi lecture under the joint auspices of the association and the society will be delivered by Dean John T. Tate, the University of Minnesota, on "Scientists in War and Peace."

*The United Chapters of Phi Beta Kappa (Dec. 30).* On Wednesday evening the eighth annual lecture under the joint auspices of the association and the society will be delivered by the Honorable Dr. Hu Shih, formerly Ambassador from the Chinese Government to the United States, on a subject to be announced.

*The American Science Teachers Association (Dec. 30)* will hold a session on Wednesday morning for the presentation of a program on "Science Teaching in War Time," which will be featured by an address by M. M. Peake, chief, Pre-Induction Training Section of the War Department, on "Science Teaching in Wartime as Related to Pre-Induction Training," and by an address by Brigadier General Lewis B. Hershey, director, Selective Service System, on "Science Instruction at all Levels in Relation to the War." Other papers will be presented by Ralph E. Horton and Arthur Rose.

The society will hold a luncheon on Tuesday afternoon and an afternoon session on "Curricular Problems," in which Warren W. Knox, Roy W. Hatch, Walter Thurber, Philip G. Johnson and Benjamin Harrow will participate.

*Gamma Alpha Graduate Scientific Fraternity (Dec. 29)* will hold a meeting of its executive board on Tuesday afternoon and a "convention breakfast" on Wednesday morning.

*Sigma Delta Epsilon Graduate Women's Scientific Fraternity (Dec. 28–30)* will hold a meeting of its "national council" on Monday morning and Wednesday afternoon; its national convention, at breakfast on Wednesday; and its annual luncheon for all women in science, on Tuesday noon.

*The American Association of Scientific Workers (Dec. 29–30)* will hold four sessions for the presentation of papers. The general subject for discussion at the first session, to be held on Tuesday morning, is "Scientific Research in the War Effort," under the chairmanship of Kirtley F. Mather, president of the society. Among the papers presented at this session will be two on "Science in Military and Naval Problems" by Colonel Alden H. Waitt and Dean J. W. Barker. "Medicine in the Armed Forces and on the



Home Front" is the title of a paper that will be presented by Dr. Morris Fishbein. On Tuesday evening a session will be held on the general subject "War Science in the United Nations."

Two sessions will be held on Wednesday, the morning session on "Science in the War of Production," under the chairmanship of Ralph W. Gerard. Papers will be presented on "Effective Use of Productive Manpower," "Effective Use of the Industrial Machine," "Supplies" and "Food." The general subject of the afternoon session is "Morale and Propaganda," under which papers will be included on "Potentialities of Psychiatry," "Psychological Warfare," "Practical Morale Building," "The Role of the Press in the Social Function of Science" and "Education under Total War."

*The Cooperative Committee on Science Teaching* (Dec. 29) will present a program on "High School

Science and the Manpower Problem." Among the subjects that will be discussed are "Where Do We Stand?," by Robert J. Havighurst; "What Can Biology Teachers Do to Meet Manpower Needs?," by Oscar Riddle; "What Can Mathematics Teachers Do to Meet Manpower Needs?," by Raleigh Schorling; and "What Can Physical Science Teachers Do to Meet Manpower Needs?," by Karl Lark-Horovitz.

*The American Biological Society* (Dec. 29) has scheduled its annual meeting for Tuesday at 5:15 P.M.

*The New York State Science Teachers Association* (Dec. 30) will meet on Wednesday with New York City teachers working on education problems of the Army and Navy to consider what can be done to make existing science courses more effective under present-day war conditions and what new science courses should be taught. Other sessions will be held on Monday and Tuesday.

## SCIENTIFIC EVENTS

### DEATHS AND MEMORIALS

DR. CHARLES SCHUCHERT, emeritus professor of paleontology and historical geology of Yale University, curator of the geological collections of the Peabody Museum, died on November 20 at the age of eighty-four years.

DR. HENRY GORDON GALE, professor of physics and dean emeritus of the Division of Physical Sciences of the University of Chicago, died on November 16 at the age of sixty-eight years.

DR. O. M. BALL, professor emeritus of biology and curator of the museum of the Agricultural and Mechanical College of Texas, died on November 11 at the age of seventy-four years. He had been with the college since 1903, retiring as head of the department of biology to become curator of the museum in 1937.

DR. TRACY GILLETTE, associate geologist of the Illinois State Geological Survey, died on November 9 at the age of thirty-seven years. Before joining the staff of the Illinois Survey he was assistant to the chief geologist of the Consolidated Oil Corporation of New York City and chief geologist of the Venezuelan Petroleum Company, a subsidiary.

DR. J. N. COLLIE, F.R.S., emeritus professor of organic chemistry at University College, London, died on November 1 at the age of eighty-three years.

DR. K. N. MOSS, professor of mining at Birmingham University and dean of the faculty of science, died on October 20 at the age of fifty-one years.

THE Physical Society, London, has founded a biennial Rutherford Memorial Lecture. The first lecture was delivered on November 6 by Professor

H. R. Robinson, professor of physics in the University of London (Queen Mary College), in the lecture theater of the Science Museum. He spoke on Rutherford's life and work up to the end of the Manchester period.

### WAR EMERGENCY COURSES IN THE UNIVERSITY

THE YALE SCHOOL OF MEDICINE, in order to help to meet the need for physicians of the armed forces, is now prepared to admit students who have completed two years of approved pre-medical college work in recognized institutions. The cut in preparation is effective with the class which will enter on December 31, 1943. This action has been taken on the recommendation of the Association of American Medical Colleges that member colleges revise their admission requirements for the duration of the war. A detailed schedule outlining the prescribed course for admission under the new requirements will be issued soon. Applications for admission to the School of Medicine may be made at any time, but acceptance under the wartime provision will be deferred until after April 5. Upon presentation of certification from the dean, accepted students may then make application for provisional commissions in the Medical Administrative Corps, U. S. Army, or the Naval Reserve Corps. Since 1922 three years of college work have constituted the minimum requirement for admission to the school, the majority of students having held bachelor's degrees.

SEVENTEEN U. S. Army medical officers are being given a special course in laboratory training and methods in the Medical School of the University of Michigan. The officers now in training are the first



of three groups which the Army is sending to the university for 12-week instruction periods. The first group will complete the course on December 19, and a second class, which will consist of twenty-seven army physicians, will arrive at the university on January 4. No date has been set for the arrival of the third group. Dr. Howard B. Lewis, chairman of the department of biological chemistry and director of the College of Pharmacy, is the coordinator in charge of a staff of eight university professors. The extensive course provides the army physicians with the latest developments in laboratory training and methods, and is designed to develop the officers into "one-man laboratories" so that they can perform any ordinary type of laboratory procedure if they are established at some isolated Army post. The officers now in training spend forty-four hours each week in university classrooms and laboratories. All of them hold commissions as first lieutenants or higher and all are college graduates with medical degrees who have been stationed at Army hospitals and medical centers throughout the country.

SIXTY college professors and high-school teachers, some of them chairmen of departments and most of them holders of the degree of doctor of philosophy, have returned to New York University as freshmen. They are specialists in such cultural subjects as English, history, philosophy, education and foreign languages. They are taking intensive courses in physics and in mathematics to meet the impending wartime need for teachers of those studies. The course in physics will cover mechanics, heat, electricity, light and sound. During the twenty-week term, the students will assist in regular laboratory sessions in addition to attending lectures, demonstrations and laboratory classes. The course is sponsored by the U. S. Office of Education, under its war-training program in engineering, science and management and is administered by the War Training Office of the College of Engineering at University Heights, N. Y.

TEACHING and research in metallurgy will be undertaken by the University of Rochester in collaboration with industrial firms that have provided \$100,000 in cash and equipment to assist in providing 5,000 trained men in metallurgy needed in the war industries.

#### METEOROLOGICAL OFFICERS IN THE ARMY AIR FORCES

MEN with high-school diplomas or their equivalent and college freshmen and sophomores have been made eligible for training leading to commissions as meteorological officers in the Army Air Forces.

The training course for high-school graduates or those of equivalent education will begin on February

1 and will require about twenty months. The college students will begin their course on March 1 and graduate in about fifteen months. Both groups will be paid while in training and will receive free uniforms, board, room and tuition.

A call for immediate applications for the courses has been issued by Dr. Carl G. Rossby, of the University of Chicago, chairman of the University Meteorological Committee and spokesman for the five universities giving professional meteorological training for the Armed Forces. Applications should be sent to the University Meteorological Committee, care of the University of Chicago.

High-school graduates will be given twelve months of pre-meteorological training, equivalent to two years of college mathematics and science. College freshmen and sophomores will receive six months of preliminary training, equivalent to the regular second-year course of college mathematics and science. Both groups will be paid \$50 a month plus \$2.35 a day for rations and quarters.

After satisfactory completion of the preliminary work, the men will become Army Aviation Cadets, with a salary of \$75 a month. They then will begin eight months of advanced training, and after completing this work will be eligible for commissions as second lieutenants in the Army Air Forces.

Academic credit toward college degrees is granted for the advanced work and credit for the pre-meteorological training is now under consideration, so that the prospective meteorologist is working also for a post-war college degree. To be eligible for the training, a student must have completed a high-school course of study in trigonometry, analytic geometry and college algebra. He also must be a citizen between eighteen and thirty years of age and be able to meet the physical standards of the Army Officers Reserve Corps.

The advanced professional meteorological training is given under the auspices of the University Meteorological Committee at the University of Chicago, the University of California (Los Angeles), the California Institute of Technology, the Massachusetts Institute of Technology and New York University. The pre-meteorological training will be given at selected institutions in all parts of the country.

There are still a few openings left for properly qualified students who wish to enter directly into the professional meteorological courses that will begin on January 4. All inquiries should be addressed to the University Meteorological Committee, care of the University of Chicago.

#### CHARLES L. MAYER AWARDS OF THE NATIONAL SCIENCE FUND

THE establishment of two prizes of the value of \$2,000, to be known as the Charles L. Mayer Awards,



which will be presented in 1942 and 1943 "for outstanding contributions to our knowledge of factors affecting the growth of animal cells with particular reference to human cancer," has been announced by Dr. William J. Robbins, chairman of the National Science Fund of the National Academy of Sciences. According to his statement, this is

a new type of prize for advancement of fundamental scientific research administered under a new type of philanthropic foundation. One prize of \$2,000 will be awarded for a contribution published in 1942 or submitted in manuscript to the National Science Fund, and a similar prize in 1943. The Charles L. Mayer Awards are a new type of award in that they will be given to further the scientific work of the recipient. They are not only rewards for past accomplishments, but are also designed to increase the opportunities of those with exceptional abilities to carry on further research.

One of the major purposes of the fund is to assist donors to increase scientific dividends from their gifts. To assist the National Science Fund in effective administration of the awards, a special advisory committee has been appointed consisting of Dr. R. R. Williams, chemical director of the Bell Telephone Laboratories; Dr. Alan Gregg, director for the medical sciences of the Rockefeller Foundation; Dr. George H. Whipple, dean of the School of Medicine and Dentistry of the University of Rochester; and Dr. Elihu Root, Jr., as the lay member. Dr. Robbins stated that the committee is interested primarily in fundamental studies on the factors influencing growth of animal cells rather than applications to any particular aspect of normal or abnormal growth.

Applications based on such studies may develop in the future, but at present more knowledge is needed of the essentials concerned. However, cancer cures and cancer preventive measures can be evaluated only after years of observation and experiment, and reports of empirical success in the treatment of human cancer will not be eligible for the awards. The Mayer awards apply to the whole field of animal cell growth and the Advisory Committee of the National Science Fund offices, 515 Madison Avenue, New York City, will welcome suggestions as to outstanding published contributions and manuscripts of 1942 on any phase of this subject.

#### THE NATIONAL FOUNDATION FOR INFANTILE PARALYSIS

BASIL O'CONNOR, president of The National Foundation for Infantile Paralysis, has announced that President Roosevelt has authorized the celebration of his birthday in January, 1943, for the annual fund-raising drive in the fight against infantile paralysis.

Mr. O'Connor states that the demands of the Na-

tional Foundation, which now has chapters covering 2,900 counties of the United States, become greater each year and the amount which it spends for research constantly increases. For the fiscal year ended on September 30, the National Foundation made grants and appropriations amounting to \$1,152,191, which, except for the year 1942, exceeds the amount the National Foundation has received in any one year as a result of the nationwide celebrations. The increased need for funds is due to the fact that the existence of the National Foundation has stimulated additional research in important fields that otherwise could not have been explored. He believed that it would be a great mistake to permit a lapse in the work which the President had sponsored and which had been going on intensively for ten years.

In his reply authorizing the celebration of his birthday, the President said: "I feel as you do—that any interruption in this work would be extremely inadvisable unless absolutely necessary. Until it is definitely known how to prevent a disease from occurring or how to prevent it from spreading, the threat of that disease—if it is epidemic—is one of our greatest dangers, even though the actual number of cases at any given time may be relatively small. As long as there are some cases the danger exists."

The President, concluded, "I feel strongly, therefore, that the work of the National Foundation must be continued and I am happy to have it use my birthday in its 1943 fund-raising drive."

#### THE NUTRITION FOUNDATION

THE sum of \$1,100,000 to support a five-year program of basic research in the science of nutrition has been contributed by a group of food and closely related manufacturers, according to a statement made by George A. Sloan, president of the Nutrition Foundation, following the meeting on November 12 of the Board of Trustees held in Chicago.

Allocation of these funds for basic research in leading universities throughout the United States was discussed by the board. Additional grants-in-aid, amounting to \$46,000, were appropriated; in all fifty-four grants were made this year to thirty-three colleges, universities and medical centers. The institutions receiving grants were Northwestern University, the Universities of Illinois, Notre Dame, Wisconsin, Virginia, Arkansas, Stanford, Rochester, California, Southern California and Cornell, Harvard University Medical School, Alabama Polytechnic Institute, Mt. Sinai Hospital, N. Y. Post-Graduate Hospital and Memorial Hospital. Previous grants made this year to mid-western institutions included the University of Chicago, the University of Illinois, the University of Minnesota, Purdue University, Wayne



University, the University of Wisconsin, Northwestern University and the Children's Fund of Michigan.

Illustrative of the type of studies being supported by the foundation under the direction of the director, Dr. Charles Glen King, and a distinguished Scientific Advisory Committee, are the following: Isolation of unstable food factors, protein utilization during partial starvation, utilization and distribution of radioactive iron, protection of the teeth afforded by specific nutrients, liver synthesis of blood proteins, nutritive protection against infection, the relation of vitamin A to muscle metabolism, nutritive value of low-cost vegetables, minimum vitamin needs of adults, metabolic balances in diabetes, nutritive protection of the blood vessels and the nutrients in cows' milk under specific conditions.

The program made possible by the food industry represents the greatest nation-wide contribution to basic research and education that any industry has

made in the history of America, according to Dr. King. He believes that the work of the foundation "will mean much in terms of better public health and an improved food supply in the United States and Canada." He pointed out that "significant results to aid in the war effort are already arising from research grants approved this spring."

The election was announced of Safeway Stores, Inc., Oakland, Calif., and the American Sugar Refining Company, New York, N. Y., as founder members of the foundation, and the election as sustaining members of Gerber Products Company, Fremont, Mich.; Golden State Company, Ltd., San Francisco; Chr. Hansen's Laboratory, Inc., Little Falls, N. Y.; McCormick and Company, Baltimore; Minnesota Valley Canning Company, Le Sueur, and the Drackett Company, Cincinnati, Ohio. It was further announced that the Great Atlantic and Pacific Tea Company had made a substantial donation to the foundation.

## SCIENTIFIC NOTES AND NEWS

THE Penrose Medal of the Geological Society of America for 1942 has been awarded to Professor C. K. Leith, of the University of Wisconsin. The medal will be presented in New York at the Christmas meeting, which was originally to have been held in Ottawa, Canada.

THE Anthony F. Lucas Gold Medal of the American Institute of Mining Engineers has been awarded to John Robert Suman, vice-president of the Humble Oil and Refining Company, Houston, Texas, a past president of the institute. The medal is in recognition of "distinguished achievement in improving the technique and practice of finding or producing petroleum."

DR. CONRAD ARNOLD ELVEHJEM, professor of agricultural chemistry at the University of Wisconsin, was presented on November 19 with the eighth annual award of distinction of the Grocery Manufacturers of America at the annual meeting of the organization, which was held in New York City.

DR. PETER KAPITZA, director of the Leningrad Physical Research Institute, was officially presented on October 27 with the Faraday Medal of the British Association of Electrical Engineers.

HONORARY membership in the Royal Agricultural Society of England, with the gold medal of the society, has been awarded to Sir George Courthope, M.P.

DR. HENRY A. PILSBRY, curator of mollusks and other invertebrates at the Academy of Natural Sciences of Philadelphia, will observe his eightieth birthday on December 8. Dr. Pilsbry has been a member of the academy for fifty-five years.

At the recent Chicago meeting of the American Association of Land-Grant Colleges and Universities, Dr. E. E. Day, president of Cornell University, was reelected president, and Dr. C. B. Hutchison, dean of the University of California College of Agriculture, was reelected vice-president.

DR. C. JUDSON HERRICK, professor of zoology at the University of Chicago, was honored with the first membership in the recently established Denison University Research Foundation. Dr. Herrick was formerly head of the department of zoology at Denison University. The foundation has a fund immediately available for an undergraduate student or a faculty member desirous of carrying out a significant study in the field of arts or sciences. The treasurer of the fund is Dr. Millard Brelsford, Granville, Ohio, to whom applications for grants should be made.

PROFESSOR C. H. MATHEWSON, chairman of the department of metallurgy of Yale University, has been elected president of the American Institute of Mining and Metallurgical Engineers. He will take office at the annual meeting in New York in February, 1943. Erle V. Daveler, vice-president of the Utah Copper Company, and Harvey S. Mudd, consulting engineer, of Los Angeles, were elected vice-presidents.

At the fifteenth annual meeting of the Central Society for Clinical Research held at the Drake Hotel in Chicago on November 6 and 7, officers were elected as follows: *President*, Dr. John Walker Moore, Louisville, Ky.; *Vice-president*, Dr. Cecil J. Watson, Minneapolis, and *Secretary-Treasurer*, Dr. Carl V. Moore, St. Louis.

DR. EUGENE L. OPIE, since 1941 emeritus professor of pathology of Cornell University Medical College, has returned to the active direction of the department during the absence of Dr. William Dock, who has been commissioned a major in the army. Since his retirement Dr. Opie has been carrying on research work at the Rockefeller Institute for Medical Research. This work he is planning to continue.

DR. JOHN M. FLETCHER, until his retirement four years ago professor of psychology and head of the department of the Tulane University of Louisiana, has been recalled to the university to take the place of a member of the faculty who has joined the Army.

DR. JEAN ALONZO CURRAN was installed on November 19 as president of the Long Island College of Medicine to fill the vacancy caused by the resignation of Dr. Frank L. Babbott.

DR. WILLIAM F. WINDLE, professor of microscopic anatomy at the Medical School of Northwestern University, has been appointed professor of neurology and director of the Neurologic Institute to succeed the late Dr. Stephen W. Ranson. Dr. Horace W. Magoun, associate professor of neuroanatomy, has been promoted to the professorship of microscopic anatomy to succeed Dr. Windle; Dr. Barry J. Anson to a professorship of anatomy and Dr. Paul B. Magnuson to a professorship of bone and joint surgery. He also becomes chairman of the department.

DR. LOUIS L. RUSOFF, of the Florida Agricultural Experiment Station, has been appointed associate dairy nutritionist at the Louisiana State University.

DR. NORMAND L. HOERR, professor of anatomy and director of the anatomical laboratories of Western Reserve University School of Medicine, has been appointed visiting professor of neuroanatomy at the School of Medicine of the University of Southern California. He will be in residence in Los Angeles until February 1, 1943. While there he will conduct the course in human neurology and will give several special lectures in southern California.

DR. THOMAS BARBOUR, director of the Museum of Comparative Zoology of Harvard University, has been appointed a member of the Advisory Committee on Inter-American Cooperation in Agricultural Education of the U. S. Department of State.

SIR LAWRENCE BRAGG and Lord Normand have been appointed members of the British Standing Commission on Museums and Galleries.

DR. H. R. DEAN, master of Trinity Hall, Cambridge, has been elected the representative of the university on the General Medical Council.

DR. W. E. HUME has been nominated by the British College of Physicians as Harveian Orator for 1943 and Dr. J. W. Brown as Bradshaw Lecturer. Dr. A. H. Gale has been appointed Milroy Lecturer.

DR. W. V. MAYNEORD, of the Royal Institution, London, gave a Friday evening discourse on November 6. He spoke on the measurement of radiation for medical purposes. On December 18, Professor J. W. Munro will discuss the place of research in the control of injurious insects.

ACCORDING to the *Journal* of the American Medical Association, the annual lecture sponsored by the Tau chapter of Nu Sigma Nu at Cornell University Medical College will henceforth be known as the Walter L. Niles Memorial Lecture in honor of the late Dr. Niles, who at the time of his death on December 22, 1941, was acting dean of Cornell University Medical College. Dr. Irvine H. Page, director of the Lilly Laboratory for Clinical Research, Indianapolis City Hospital, gave this year's lecture on October 20. He spoke on "The Modern Concept of Hypertension."

DR. GEORGE C. VAILLANT, director of the University Museum, Philadelphia, gave, on October 30, an address entitled "Indian Society in Ancient Mexico" at the Cranbrook Institute of Science.

THE fourth annual Barnard Hospital Lecture was delivered on November 17 by Dr. Peyton Rous, of the Rockefeller Institute, in the auditorium of the St. Louis Medical Society. His subject was "The Nearer Causes of Cancer."

THE annual winter meeting of the American Astronomical Society will be held from December 28 to 30 at the Dearborn Observatory of Northwestern University.

BECAUSE of war conditions, the annual dinner of the New York Academy of Sciences and Affiliated Societies will not be held this year. The annual meeting for the election of officers, the election of fellows, the presentation of reports and the transaction of other business will be held in the American Museum of Natural History at 8:00 P.M. on December 18. The meeting will be followed by a program, of which a special notice will be sent to the members.

THE Council on Dental Education of the American Dental Association is now engaged in examining, for the purpose of classification, the thirty-nine dental schools of the United States. Dr. Harlan Horner is the executive secretary of the council.

THE late Sir Joseph Larmor, F.R.S., has bequeathed to the University of Cambridge £2,000 to be devoted to providing medical and surgical assistance to junior members of the university.



RESEARCH grants of more than \$5,000 have been received by Stanford University in support of work in tropical diseases. These include \$4,000 from the Josiah Macy, Jr., Foundation, \$850 from the Carnegie Corporation of New York, \$400 from the National Academy of Sciences, and \$200 from the May Esther Bedford Fund, Inc., of Connecticut. Other subscribers are the Higher Studies Fund at Oxford, the British Association for the Advancement of Science, the Ella Sachs Plotz Foundation and the Viking Fund. E. P. Mumford, research associate at the university, is in charge of an investigation of the geographical distribution of insects and other disease carriers and of the parasites of man in relation to the war and its aftermath. The study is being made with special emphasis on the Pacific islands.

THE regents of the University of Texas have agreed to take over the Texas Dental College. A one hundred thirty-four-acre site for the new medical center will be provided by the M. D. Anderson Foundation of Houston with funds for a dental building. The final arrangements are subject to authorization by the State Legislature.

GROUND has been broken on the "engineering quadrangle" of the Ohio State University for a small laboratory building to comprise two new units for the radiation laboratory. When completed about March 1, it will house an electrostatic generator developing three-million-volt x-rays, used to produce artificial radioactive substances, and an electron accelerator producing 20-million-volt x-rays. Other units of the radiation laboratory already installed are the cyclotron in the Engineering Experiment Station and the electron microscope in the Communications Laboratory. They represent a cooperative research program of the departments of physics, electrical engineering, chemistry and medicine, although the equipment also is available to other university departments. Because of the special work to be done in it, the new laboratory will have double walls of concrete blocks with earth between, it will be constructed half above ground and half below, and it will have a concrete roof.

The *Times*, London, reports that a grant from the Pilgrim Trust has enabled the owners of certain important manuscripts of Charles Darwin to present some of them to the Library of the University of Cambridge, and some to the British Association for preservation at Down House. The gift includes the manuscript of Charles Darwin's "Autobiography," the manuscript of the "Diary of the *Beagle*," with the field notebooks from which it was compiled, most of the manuscript of the "Origin of Species," the manuscript of "Movements of Plants," "Climbing Plants" and other works; correspondence with Wallace, Samuel Butler, Huxley and other contemporaries; a number of personal papers and of memoranda relating to Down; and a collection of pamphlets, some with annotations. It was in 1842 that Charles Darwin went to live at Down House. The first sketch, in his handwriting, of his species theory, written in 1842, is included in the gift.

THE Canadian controller of metals, according to the *Times*, London, has announced the discovery at Preissas, in northwestern Quebec, of a deposit of molybdenum. The deposit is at least 400 feet long and 200 feet deep and of an average width of 30 feet. It is hoped that its exploitation, which will be proceeded with immediately, will solve the problem of an acute metal shortage.

THE University of Ceylon was formally inaugurated at Colombo on July 14, by Dr. Ivor Jennings, the first vice-chancellor of the university. A notice in *Current Science* reads: "Ceylon's education was hitherto linked up with the University of London and although the creation of an independent university for Ceylon was under proposal for some years its inauguration so soon would not have been possible but for the extraordinary energy and enthusiasm of Dr. Jennings. His efforts have thus resulted in giving a fillip to the much desired want in the educational system of the island. The university is residential with faculties for arts and sciences, Oriental languages and medicine for the present. It is learned that the faculty of law will be added later on."

## DISCUSSION

### BACTERIAL GENERIC NAMES AS COMMON NOUNS

Two recent papers<sup>1</sup> have called attention to the justification for using generic names in the plural, if they are treated as common nouns and are not capitalized. Their point of view has so much logic and

common sense behind it that it will be readily accepted by all except those who are distinctly opposed to using terms both as scientific names and as common names. As the present writers, however, have at times opposed a similar practice among bacteriologists, this note is written to clarify the situation and to show that we are not in opposition to the opinions of Dr. Mast and Dr. Beers.

<sup>1</sup> Mast, *SCIENCE*, 96: 252, 1942; Beers, *SCIENCE*, 96: 403, 1942.

Generic names have been used as common nouns by bacteriologists from the earliest days of that science, as is witnessed by the ordinary use of such words as "bacteria," "bacilli," "micrococci," "streptococci"; and no one has ever raised any serious objection to this usage. Recently, however, a tendency has appeared in bacteriological literature which is more open to question. The following sentence is an illustration of this undesirable usage: "none of the rhizobia are able to grow in this medium except *Rhizobium meliloti*." In this sentence it is obvious that "rhizobia" is not used in the sense of "specimens" or even "individuals of the genus *Rhizobium*," but rather to mean "species (pl.) of *Rhizobium*." In other words, the mistake is made of allowing the singular, "rhizobium," to stand for a species, not for an individual. This is the practice to which we take exception. The four terms mentioned in the first sentence of this paragraph are rarely, if ever, so used.

It is quite possible that this practice is confined to bacteriology. Certainly none of the instances mentioned by Dr. Mast and Dr. Beers represent nouns used in the above sense. In any event it seems well to call the matter to the attention of those interested in nomenclature; and to explain our reason for opposing the occasional misuse of bacterial generic names as common nouns.

R. S. BREED

H. J. CONN

NEW YORK AGRICULTURAL EXPERIMENT STATION,  
GENEVA

#### ANOTHER MOULD WITH ANTI-BACTERIAL ABILITY<sup>1</sup>

SEARCHING for new anti-bacterial substances among by-products of the growth of *Fungi Imperfecti* we have noticed that one culture of *Aspergillus* sp. of the *Candidus* group gave a positive reaction for the presence of citrinin. The substance isolated in crystalline form showed the same properties as those described by Hetherington and Raistrick.<sup>2</sup> Its bacteriostatic properties and selective action on Gram-positive bacteria further indicate the similarity to citrinin.

Comparing the data published by Oxford<sup>3</sup> on the bacteriostatic power of citrinin it appears that our substance in purified or crude state is somewhat stronger. Thus growth of *Staphylococcus aureus*, in nutrient or 1 per cent. glucose broth, was completely inhibited in dilution 1:64,000; *Staph. albus* 1:128,000; *B. mycoides* 1:128,000. Partial inhibition (about 50 per cent. opacity) was shown in 1:1,024,000 dilution for all above-mentioned organisms. In lower

<sup>1</sup> Contribution No. 157 (Journal Series).

<sup>2</sup> A. C. Hetherington and H. Raistrick. *Phil. Trans. Royal Soc. of London*, Series B, 220: 269-295. 1931.

<sup>3</sup> A. E. Oxford. *Chem. Ind.*, 61: 48-51. 1942.

dilutions\* (1:8,000 or 125γ per ml) it showed bactericidal ability in the case of *Staph. aureus* and *albus*. Furthermore, autoclaving of the serial dilutions for 30 minutes at 15 pounds pressure did not reduce the bacteriostatic power of the substance.

M. I. TIMONIN

DIVISION OF BACTERIOLOGY AND  
DAIRY RESEARCH,  
DEPARTMENT OF AGRICULTURE,  
OTTAWA

#### A METEORITE FROM VERMONT

THE first meteorite to be recorded from Vermont was discovered by the writer on Whitcomb Hill in the town of Strafford, Vermont, in August, 1942, while engaged in geological field work. It was not seen to fall but lay upon the surface of the ground when found.

The specimen is an iron meteorite weighing five pounds and two ounces. Its shape is triangular, much like that of a flatiron, having a maximum length and width of 5.5 inches and 4 inches, respectively, and a thickness of 2.5 inches. The characteristic Widmanstätten figures were brought out microscopically on a polished surface by etching with a dilute solution of nitric acid. The weathered surface is a dark, rusty brown.

The meteorite has been named the South Strafford meteorite because of the nearness of this village to the place of discovery. Further work on this meteorite is in progress.

CHARLES G. DOLL

UNIVERSITY OF VERMONT

#### THE TOOLS OF SCIENCE AND THE WAR INDUSTRY

THE services that science can render to the war effort are of many kinds. The means for contributing some are readily at hand, while the means for contributing others must be created. Stanford University has had the privilege of assisting in an enterprise of the latter class that deserves to be reported as a possible source of ideas applicable in other instances. The experience is especially instructive as evidence of what can be accomplished through cooperation of a number of unrelated agencies working toward a common goal that no one of the agencies could have attained by itself.

An inquiry initiated at Stanford last spring into opportunities for contribution of statisticians to the war effort led to a suggestion from Dr. W. Edwards Deming, that a short course be offered to promote the adoption of recently developed statistical methods of quality control, and improved methods of sampling for tests of quality, in West Coast war industries. The suggestion posed two problems: that of providing for the requisite instruction, and that of bringing to



the course men actually in a position to apply the methods.

Suitable machinery for organizing and financing the suggested course was already in existence in the engineering science and management War Training Program, financed by the Office of Education. The institutional director of the program at Stanford took up the plan with enthusiasm. Aided by active support from the Ordnance Department, through its San Francisco District Office, he was able to bring together in early July, less than six weeks after the original suggestion had been received, a group of twenty-nine key men from industries holding war contracts and from procurement agencies of various branches of the armed services. These men, with three others, entered upon an intensive ten-day course with classes running eight hours a day. All thirty-two men completed the course.

The success of the first course, given at Stanford University in July, led to demand for a repetition. A second course, offered in Los Angeles in September, was equally gratifying in its results. Ten of the men attending the second course came from organizations that had sent one or two men each to the first course. Further repetitions of the course are in prospect. The two courses thus far offered have given training in specialized statistical methods for saving time and

materials in the war production program to thirty-nine key men from war industries, assigned by their companies to attend the course, to fifteen men assigned by various branches of the armed services, and to five others admitted on the ground that because of previous special training in statistics they might become peculiarly useful to either war industry or the armed services.

The instructional program itself rested on a high degree of cooperation. Four instructors worked together in each course. Two, Professors Eugene L. Grant and Holbrook Working, came to the enterprise from different departments of Stanford University. The Bureau of the Census contributed the services for both courses of Dr. W. Edwards Deming. A fourth man on the staff for each course was drawn from industry to present the point of view of a man meeting from day to day the practical problems of applying the methods under discussion. This place was taken in the first course by Mr. Charles R. Mummery, of The Hoover Company, North Canton, Ohio, and in the second course, by Mr. Ralph E. Wareham, of the General Electric Company.

HOLBROOK WORKING,

*Chairman of the Committee on Instruction  
in Statistics*

STANFORD UNIVERSITY

## SCIENTIFIC BOOKS

### THE CRISIS OF OUR AGE

*The Crisis of Our Age: The Social and Cultural Outlook.* By PITIRIM A. SOROKIN. Pp. 338. New York: E. P. Dutton and Company, Inc. 1941. \$3.50.

THIS is an epitome for the general reader of the author's technical four-volume "Social and Cultural Dynamics." The large proportion of space devoted to the historic rôle of the sciences in Western civilization would alone justify a review of the work in SCIENCE.

That our Western civilization is in crisis few would question. The crisis, Sorokin maintains, is not merely an economic or political one. It involves almost the whole of Western culture and society: art and science, philosophy and religion, law and morals, manners and mores, the forms of social, political and economic organization, the nature of marriage and the family. These various phases of our culture and society are largely interdependent and each is largely derivative from a dominant form of prevalently held basic principles and values.

To the three dominant forms or supersystems which

Sorokin analyzes he gives the names ideational, idealistic and sensate. In the ideational form, supersensory, other-worldly and religious reality and value are regarded as supreme. In the sensate form, sensory, this-worldly and secular reality and value are so regarded, while the supersensory is considered either doubtful as reality or fictitious as value. In the idealistic form, both realities and values are recognized. At no given time in any given culture and society does any one of the three forms exclusively prevail and operate, either in all compartments of life or among all classes and individuals, to the complete blackout of the others. The three supersystems are conceived more as dominant forms of integration than as absolutely monopolistic ones.

One or other of the forms has historically held sway in different periods of all the great cultures. Thus, Greek culture from the eighth to the end of the sixth century B.C. was dominantly ideational, and in the fifth and fourth centuries B.C., idealistic; while Greco-Roman culture from the third century B.C. to about the fourth century A.D. was sensate. Then the ideational configuration came to the fore, persisted through the medieval period to the end of the twelfth century, and

was succeeded by the idealistic in the thirteenth and fourteenth centuries, which in turn gave place to the sensate that has prevailed in modern Western culture for the last four or five hundred years.

The cause of the historical oscillation from system to system is at base internal. Both the ideational and the sensate systems are partly true and partly false. When one of them tends to become monopolistic, its false part grows at the expense of its valid part, leading to a partial retreat from total human reality and value, with disastrous consequences for intellectual and esthetic creativeness, economic security and social order.

Our present crisis is due, Sorokin believes, to the fact that the fundamental form of modern Western culture and society—the sensate—is declining. This decline will be followed, not by the death of Western civilization as such, in the Spenglerian or other pessimistic sense, but by survival with the emergence of and shift to a neo-ideational or neo-idealistic dominant configuration.

The present work, like the original "Social and Cultural Dynamics," is well calculated to call forth either rabid or rapturous responses in the reader, depending in part on his sympathies with or antipathies to "ideational," "idealistic" or "sensate" philosophies of life. For while the author defends his hypothesis with an impressive mass of factual data, he permits his own sympathies and antipathies to show through on page after page of his discussion, and perhaps even in the appellation "sensate."

As regards Sorokin's statistical methods, for which he has been so severely criticized, it must be said in his defense that most of the criticisms have been met by him in anticipation (*cf.*, *e.g.*, "Social and Cultural Dynamics," III, N. Y., 1937, ch. 9). He explicitly recognizes weaknesses in his statistical treatment of the cultural and social units manipulated, but maintains that it yields an appreciably more accurate measurement of long-time cultural drifts than does the customary verbal quantitative treatment of the classic historian.

Less defensible and more questionable are a number

of concrete historical statements. Such, to illustrate by just three, are: "the climax (in number and importance of discoveries) in most of the exact sciences was reached, not in the twentieth century, but either in the nineteenth or (for mathematics) the eighteenth century" (p. 128); "psychology and anthropology of the twentieth century are, again, either a mere accumulation of so-called facts or, even worse, a definite decline so far as real insight into the respective phenomena is concerned" (p. 267); "mental disease [not merely clinical recognition thereof or institutional intake] has been on the increase, particularly during the past few decades" (p. 207).

Sorokin appears to have made a good case for the operation of internal factors, above noted, in the historic oscillation of supersystems. But are these the only crucial factors? For example, as "ideational" patterns tend on the whole to be more prominent in cultures of low than in those of high scientific and technological levels, may not the decline of the sensate supersystem and the emergence of the ideational in Europe about the fourth and fifth centuries A.D. have been in critical measure the consequence of external causation, namely, the barbarian invasion? As regards, then, Sorokin's prognosis for Western civilization, one is inclined to say: Maybe, but can we predict without knowledge of *all* the great determinant factors in change?

All in all, however, whether we agree or disagree in whole or in part with the author, his great synthesis is an arresting one. He has had the courage to attempt a task of exceptional magnitude and he has carried it to completion with dogged energy, singular resourcefulness and originality, and high creative ability. His theory, at its lowest valuation, gives us a formula that enables us to think of great masses of data in an orderly and meaningful way. At a higher valuation, it gives us illuminating insights into some of the most significant inner realities of culture, society and life, and of the impact of science thereon.

JOHN M. COOPER

THE CATHOLIC UNIVERSITY  
OF AMERICA

## SPECIAL ARTICLES

### THE PRESENCE OF A CORTIN-LIKE SUBSTANCE (COLD PROTECTING MATERIAL) IN THE URINE OF NORMAL MEN<sup>1</sup>

THE fact that adrenalectomized rats and mice are more sensitive to low environmental temperatures than normal animals has been demonstrated by various

<sup>1</sup> Supported in part by a grant from the Josiah Macy Jr. Foundation.

investigators<sup>2, 3, 4, 5</sup>. Adrenalectomized rats subjected to low temperatures may be protected by adrenal

<sup>2</sup> F. A. Hartman, K. A. Brownell and A. A. Crosby, *Am. Jour. Physiol.*, 98: 674, 1931.

<sup>3</sup> H. Selye and V. Schenker, *Proc. Soc. Exp. Biol. and Med.*, 39: 518, 1938.

<sup>4</sup> R. Tyslowitz and E. B. Astwood, *Am. Jour. Physiol.*, 136: 22, 1942.

<sup>5</sup> M. Zarrow, *Proc. Soc. Exp. Biol. and Med.*, 50: 135, 1942.



cortical extracts<sup>2, 3, 4</sup> and by pure adrenal cortical steroids such as desoxycorticosterone<sup>4, 6</sup>, corticosterone<sup>7</sup> and compound E<sup>7</sup>. Adrenalectomized mice may also be protected by adrenal cortical extract<sup>8</sup>, desoxycorticosterone<sup>5, 6</sup> and progesterone<sup>5</sup>. We have used this test of sensitivity of adrenalectomized rats to low temperatures to demonstrate material in the urine of normal men which appears to be related in its biological action to the adrenal cortical steroids. We are not prepared at this time to say whether this biologically active material is specifically an adrenal cortical steroid metabolite. Our experience thus far, however, suggests that this may be true.

Cortin-like action of extracts of urine from various types of patients has been reported by Anderson, Haymaker and Joseph<sup>8</sup> and by Weil and Browne<sup>9, 10</sup>. These investigators studied urine from patients with Cushing's syndrome, hypertension, chronic osteomyelitis, as well as post-operative patients who had no symptoms of shock. The former group of investigators used the maintenance of the adrenalectomized rats as their means of demonstrating biological activity, while the latter group used the technique described by Selye and Schenker<sup>3</sup> involving the sensitivity of the adrenalectomized rats to cold. Perla and Marmorstein-Gottesman<sup>11</sup> reported the presence of a benzene soluble material in human urine which was capable of increasing the resistance of adrenalectomized rats to histamine, while Grollman and Firor<sup>12</sup> reported that benzene extracts of human urine were capable of maintaining adrenalectomized rats.

The urines of three normal men, 26, 26 and 31 years of age, respectively, were collected over a three-day period. The fresh urine was extracted three times with ethylene dichloride at room temperature. For each extraction one part of ethylene dichloride to four parts of urine was used. The ethylene dichloride extracts were evaporated to dryness *in vacuo*, taken up in small volumes of absolute ethanol and again evaporated to dryness. This procedure was repeated twice. This technique is similar to that previously employed by Weil and Browne<sup>10</sup>. The final dry, brownish oil was taken up in 10 per cent. ethanol and administered by stomach tube to adrenalectomized rats weighing 35 to 45 grams. The rats were adrenalectomized 24 hours before the assay was run. The details of the assay technique will be described in another report.

<sup>6</sup> Unpublished experiments.

<sup>7</sup> E. C. Kendall, *Jour. Am. Med. Assn.*, 116: 2394, 1941.

<sup>8</sup> E. Anderson, W. Haymaker and M. Joseph, *Endocrinology*, 23: 398, 1938.

<sup>9</sup> P. Weil and J. S. L. Browne, *SCIENCE*, 90: 445, 1939.

<sup>10</sup> P. Weil and J. S. L. Browne, *Proc. Am. Physiol. Soc.*, 121: 652, 1939.

<sup>11</sup> D. Perla and J. Marmorstein-Gottesman, *Proc. Soc. Exp. Biol. and Med.*, 28: 1024, 1931.

<sup>12</sup> A. Grollman and W. W. Firor, *Proc. Soc. Exp. Biol. and Med.*, 30: 669, 1932-3.

The results on the urines collected from three normal men are represented in Table 1. It is seen that the

TABLE 1  
RESPONSE OF ADRENALECTOMIZED ANIMALS (EXPOSED TO 5° C.)  
TO EXTRACTS, FROM THE URINE OF NORMAL MEN

Subject Number	Age	Urine collec- tion Days	Administered per rat extract equivalent		Num- ber of rats	Mean sur- vival Hours	Increase in mean survival Per cent.
			cc	Hours			
—	—	—	0	0	9	5.9	—
1.	26	3	295	6.0	8	8.7	48
2.	26	3	194	5.8	10	8.1	37
3.	31	3	236	6.0	9	8.9	51

equivalent of 6.0, 5.8 and 6.0 hours of urine respectively produced increases in survival time of 48 per cent., 37 per cent. and 51 per cent., respectively. When these increments are compared to the responses found for a Wilson Adrenal Cortical extract, it is found that the urine contains cortin-like material equivalent to 0.15 to 0.18 cc of extract per day.

In addition to the experiment described above, it has been possible to demonstrate cortin-like activity in the extracts of composite samples of normal male urine and in the urine of post-operative male patients, but we have been unable thus far to detect such activity in the urine of patients with Addison's disease.

RALPH I. DORFMAN  
BENJAMIN N. HORWITT  
WILLIAM R. FISH

THE BRUSH FOUNDATION AND DEPARTMENT OF  
BIOCHEMISTRY, WESTERN RESERVE UNIVERSITY  
SCHOOL OF MEDICINE, AND DEPARTMENT OF  
MEDICINE, LAKESIDE HOSPITAL, CLEVELAND, OHIO

## HAY FEVER AND VITAMIN C

DURING the past four years one of us made occasional observations indicating a lowering of the body level of vitamin C during hay-fever attacks.

### HISTAMINE THEORY

Other workers developed the interesting theory that histamine,  $C_5H_9N_2$ , although a normal constituent of the blood, is thrown into the blood stream in excessive amounts during allergic attacks and that this excess histamine is responsible for some of the unpleasant symptoms. On the assumption that histamine might react with vitamin C, or ascorbic acid, we mixed water solutions of the two substances but observed no reaction in absence of free oxygen. Upon bubbling a slow stream of air through the solution it was easy to detect evolution of ammonia. Titration with 2,6-dichlorophenol-indophenol showed loss of vitamin C. Later we learned that this reaction was already known. Since there is a little dissolved oxygen in blood serum, the body furnishes the proper conditions for very slow reaction.

## REQUIRED REPLACEMENT OF VITAMIN C

A low level of vitamin C in the body causes weakness as well as other ills, so it is apparent that losses due to hay fever should be made good by a diet extremely rich in this vitamin, or even, in severe attacks, by administration of the pure synthetic product.

Many tests of this idea have been made by others, but there has been much confusion as to the dosage of ascorbic acid required for relief.

We therefore experimented<sup>1</sup> with twenty-five hay-

<sup>1</sup> We are in debt to Dr. H. A. B. Dunning, of Baltimore, for generous support of this research.

TABLE 1

THE RESULTS GIVEN IN TABLE 1 ARE SIGNIFICANT. THE SIGN "—" MEANS THERE WAS NO DETERMINATION OR DOSAGE FOR THAT COLUMN

Patient number	Vitamin C in 24-hour urine before dosage	Excretion of C after one week of 100 mg daily	Symptoms after one week of 100 mg daily	Symptoms after week of 200 mg daily	Symptoms after dosage of 500 mg daily
1	49 mg	—	—	"Immense improvement." Gain after two days	—
2	8 mg	218 mg ? (after dose of 200 mg daily)	No relief	Distinct gain	"No hay fever" after 3 days
3	8 mg	1-6 mg (after 2 days of 600 mg rose to 96 mg)	No relief	—	"Much better" after 2 days
4	42 mg	90 mg	No relief	Slight gain	"Almost no hay fever" after 4 days
5	20 mg	35 mg	Some relief	Decided relief	"Almost no hay fever" after 2 days
6	11 mg	73 mg	No relief	No relief	"Hay fever practically gone" after 3 days
7	6 mg	1-6 mg (after 3 days of 500 mg rose to 102 mg)	Some relief	—	Great relief after 3 days
8	16 mg	(after 12 days rose to 221 mg)	—	Great relief	—
9	—	—	Little relief	Great relief	—
10	—	—	Little relief	Great relief	—
11	—	—	Little relief	"Felt fine"	—
12	—	—	—	"Better physical condition"	"Highly favorable reaction. More refreshing sleep" after 2 days
13	16 mg	160 mg ?	No relief	—	"Distinctly better" after 3 days
14	—	—	—	Great relief in few days	—
15	—	—	—	"Much less tired"	—
16	—	—	Definitely improved	—	—
17	9.5 mg	105 mg	Some relief	—	—
18	—	—	"It helped"	—	—
19	—	—	—	Began in July. "No hay fever at all—after years of suffering"	—
20	0-5 mg	67 mg (after 10 days of 200 mg daily)	—	Vast improvement. From weakness to vigor	—
21	—	—	—	—	(Invalid from asthma.) After 1 week became astonishingly vigorous and healthy
22	High	Higher	No relief	No relief	Little relief
23	63 mg	118 mg ?	No relief	—	No relief after 3 days
24	10 mg	—	Broke out in rash and quit	—	—
25	—	—	—	—	1000 mg gave great relief the next day



fever sufferers in Oberlin at three levels of vitamin intake; 100 mg, 200 mg and 500 mg daily, administered during the ragweed season from August 15 to September 15.

#### URINARY EXCRETION

In most instances we were able to determine the 24-hour urinary excretion<sup>2</sup> of vitamin C before giving the first dose. Whenever possible we determined the daily excretion again after one week. It is the general opinion that a healthy individual of average weight excretes from 30 to 50 mg of vitamin C daily in the urine.

With ordinary methods of collection we have observed considerable loss by oxidation, so we used the very simple but effective method previously devised by Holmes and Campbell.<sup>3</sup>

The maximum pollen count in Cleveland, thirty-five miles from Oberlin, averaged about 87 for the last half of August and about 80 for the first half of September. "Sneezing begins at 15." Oberlin, away from Lake Erie, has more pollen than Cleveland.

The initial daily vitamin C excretion of twelve patients (including three not charted) averaged only 10 mg, indicating a very low level, due to destruction or inactivation of the vitamin. One excreted 20 mg, three were satisfactory and the others were not measured.

Usually, after a week of treatment the excretion rose to excellent levels, in some instances indicating body saturation. Strangely enough, patients No. 1 and No. 4 showed very good vitamin C levels before starting treatment, yet they were greatly benefited by adequate dosage.

It is evident from the table that only five sufferers made a noticeable gain in health after a week of 100 mg daily dosage, while twelve gained decidedly after a similar period of 200 mg dosage and eight reported remarkable improvement after three or four days at the 500 mg level. One got almost immediate relief

after a single dose of 1,000 mg. Apparently there was distinct gain with 88 per cent. of the patients.

#### TREATMENT

We strongly recommend that pharmaceutical firms prepare 250 mg tablets of vitamin C (or capsules to be emptied on the tongue) in order to lower the cost and to simplify dosage. The patient (after consulting the family physician, as was done in our own recorded experiments) would do well to begin with a daily 250 mg dose and, if no decided improvement results after one week, to try 500 mg daily until satisfactory progress is observed. After that he might get along comfortably on 250 mg or less during the season.

Since excess vitamin C is excreted rapidly in the urine, it is impossible to go beyond body saturation. Rarely are any irritating effects observed, yet one of our patients reported development of a rash.

#### REDUCING ACIDITY FOR SENSITIVE PATIENTS

Patients objecting to the acidity of ascorbic acid are advised to mix with the vitamin an amount of baking soda nearly equivalent chemically. If the vitamin is visibly crystalline, equal volumes of vitamin and sodium bicarbonate are used; if the vitamin is in a fluffy powder form, about one third that volume of sodium bicarbonate will serve. It is a mistake to mix water solutions to be kept for days, as oxidation occurs rapidly in the neutralized vitamin solution. We proved, by tests on several people, that after keeping a mixture of the dry powders eight hours and then administering there was no apparent loss of the vitamin. Patients with gastric ulcer, usually on a diet low in vitamin C because of difficulty with the roughage of vegetables and the acidity of fruits, may profit by the observation above.

HARRY N. HOLMES

WYVONA ALEXANDER

SEVERANCE CHEMICAL LABORATORY,  
OBERLIN COLLEGE

## SCIENTIFIC APPARATUS AND LABORATORY METHODS

### A SIMPLIFIED PROCEDURE FOR THE CONCENTRATION AND PURIFICATION OF INFLUENZA VIRUS<sup>1</sup>

THE observations of Hirst<sup>2</sup> and McClelland and Hare<sup>3</sup> have clearly demonstrated that influenza virus

<sup>2</sup> Miss Jean Risinger assisted us with some of the analytical work.

<sup>3</sup> Harry N. Holmes and Kathryn Campbell, *Jour. Lab. Clin. Med.*, 24: 1293, 1939.

<sup>1</sup> These investigations were aided through the Commission on Influenza, Board for the Investigation and Control of Influenza and Other Epidemic Diseases in the Army, Preventive Medicine Division, Office of the Surgeon General, United States Army.

in chorioallantoic fluid of the chick embryo can be directly adsorbed by the erythrocytes of the embryo. Hirst<sup>4</sup> has also shown that the adsorbed virus can be readily eluted from the red blood cells at temperatures of 22° to 37° C. In addition, these investigators have pointed out<sup>5,6</sup> that the precipitate which forms when

<sup>2</sup> G. K. Hirst, *SCIENCE*, 73: 335, 1941.

<sup>3</sup> L. McClelland and R. Hare, *Canadian Public Health Jour.*, 32: 530, 1941.

<sup>4</sup> G. K. Hirst, *Jour. Exp. Med.*, 76: 195, 1942.

<sup>5</sup> G. K. Hirst, E. R. Rickard and L. Whitman, *Proc. Soc. Exp. Biol. and Med.*, 50: 129, 1942.



infected fluid is frozen and then thawed contains the bulk of active virus and have employed the procedure for the concentration of influenza virus.

Certain technical difficulties accompany concentration by precipitation. Care must be taken, while harvesting the fluid, not to rupture the blood vessels since adsorption of virus by red cells results in an appreciable diminution in titer of the fluid. The temperature during the collection of the precipitate must be maintained at or about 0° C. and agitation must be carefully avoided. The procedure for concentration of the Lee strain of Type B virus requires an adjustment in pH. There is a bulk of non-specific material in the precipitate, only part of which is soluble. After drying *in vacuo* the insoluble residue increases.

It appeared that utilization of embryonic red cells for the concentration of virus might eliminate some of these difficulties if satisfactory adsorption and elution could be obtained without loss of activity. This has been possible. The essential features of the procedure adopted are as follows: Into the allantoic sac of hen's eggs, containing embryos in the eleventh or twelfth days of incubation, is inoculated 0.1 cc of a 10<sup>-3</sup> dilution of infected allantoic fluid in physiological salt solution. Either the PR8 strain<sup>7</sup> of type A or the Lee strain<sup>8</sup> of type B virus has been used. The extra-embryonic fluids are harvested 48 hours later. The shell over the normal air sac is removed, the shell and chorioallantoic membranes and the blood vessels are torn with sterile forceps; the amnion and its main vessel are also torn. The embryo is allowed to bleed into the fluid while the egg is rotated so as to obtain mixing and to prevent the formation of clots. The bloody fluid is removed by aspiration with needle and syringe and collected in a 250 cc centrifuge bottle immersed in an ice-water bath at a temperature of 4° to 6° C. Chilling is important, since it increases the degree of adsorption and limits the elution which occurs rapidly at higher temperatures. The fluid from additional eggs is collected in the same manner and added. The red cells agglutinate while still in the egg and form coarse clumps in the collecting vessel. Since adsorption occurs very rapidly the process reaches its maximum in the time required to harvest the fluid from a few eggs.

When the desired volume of fluid is collected, the red cells, constituting 2 to 2.5 per cent. of the total volume, are separated by centrifugation in a chilled cup for three minutes at 500 to 1,000 r.p.m. The supernatant fluid and any light fibrinous aggregates are poured off and discarded. At this stage the cells are strikingly cohesive and resemble a disc of soft

gelatin. The surface of the sediment is gently rinsed with cold (4° C.) 0.85 per cent. sodium chloride solution. No effort is made at this time to break up the agglutinated cells, since it tends to induce hemolysis. The wash fluid remains clear. To the washed, sedimented cells physiological salt solution is added in an amount equal to one tenth the original volume or less, depending upon the degree of concentration desired. The mixture is placed in a water bath at 37° C., agitated gently until the temperature is raised and the suspension is then placed in an incubator at 37° C. for two and one half hours. The clumps of agglutinated cells gradually disperse as the virus is released. The red cells are then centrifuged from the suspension and the supernatant fluid which represents the concentrate is removed. The preparation is usually slightly opalescent with a faint pink tinge.

In this manner approximately tenfold concentration of both the PR8 and Lee strains of virus has been obtained consistently. The infectious and agglutinating titers of the concentrate have remained essentially constant for at least three weeks in the refrigerator. Evidence points to the fact that the major portion of the inert chick protein is eliminated in that no significant precipitate is observed when the material is thawed after freezing with CO<sub>2</sub> ice nor after prolonged standing in the refrigerator. On rehydration after freezing and drying a small amount of finely suspended material remains undissolved.

The results indicate that the simplified procedure of adsorption and elution from embryonic red cells is as effective as precipitation in concentrating influenza virus from infected chorioallantoic fluid and takes advantage of technical features which serve as sources of difficulty in the precipitation process. Experimental results will be presented in detail in a subsequent publication.

THOMAS FRANCIS, JR.  
JONAS E. SALK<sup>9</sup>

DEPARTMENT OF EPIDEMIOLOGY AND THE VIRUS  
LABORATORY, SCHOOL OF PUBLIC HEALTH,  
UNIVERSITY OF MICHIGAN

<sup>9</sup> Fellow in the Medical Sciences of the National Research Council.

## BOOKS RECEIVED

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<sup>6</sup> R. Hare, L. McClelland and J. Morgan, *Canadian Public Health Jour.*, 33: 325, 1942.

<sup>7</sup> T. Francis, Jr., *SCIENCE*, 80: 457, 1934.

<sup>8</sup> T. Francis, Jr., *SCIENCE*, 92: 405, 1940.